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# BORDEN'S REVIEW

# *of*

# NUTRITION RESEARCH

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# NUTRITION IN PUBLIC HEALTH
## *The Newfoundland Nutrition Resurvey*

By RUTH WOODS

Following the 1944 nutrition surveys indicating widespread malnutrition among the people of Newfoundland, many changes occurred simultaneously to bring about a marked alteration of these conditions. These included not only the establishment of a concrete nutrition program, but also a fortunately coincident improvement in social and economic conditions as a result of the war. In 1948 two resurveys were conducted on population samples essentially identical to the previous ones. These included an unselected sampling of the east and south coast outports, and a specially selected weighted sample of persons under conditions of nutrition stress at Norris Point on the west coast. Four years must be considered a very short period where reeducation of entire population groups is one of the major factors in establishing nutritional changes. As a matter of fact, many of the important phases of the program were not made possible until late in 1947, some fifteen months before the resurvey. The 1948 resurvey nevertheless revealed noticeably improved conditions with a good possibility for further achievements in the future.

### *Economic Conditions In Newfoundland In 1948:*

The improving economic status which had scarcely begun to be apparent in 1944 was obvious by 1948. Newfoundland, now a world crossroads, was participating actively in foreign commerce. Large military and naval installations had been established and commercial planes were leaving daily from the huge airport at all hours of the day and night. Fishing, lumber and mineral resources had increased substantially. Relief participants had dropped from 90,000 in 1933 (one-third the total population) to less than 8,000 in 1943. By 1948, the fisherman's income had jumped from an annual average of $140 in 1935 to as much as $2000 for occasional fishermen. Stores, largely empty in 1944, were now piled high with stocks. Money was being spent freely, although not always wisely; homes and clothing were noticeably improved. The cost of food, as well as the overall cost of living index, had risen sharply, as elsewhere, and was nearly double in 1948 than what it had been in 1938.

The country's budget had increased, as a result of increased revenue, from $12,000,000 before the war to $28,000,000 in 1943 and $40,000,000 in 1947. United States military bases in 1947 paid $6,500,000 to 3,000 Newfoundland permanent employees (in addition to payments to temporary employees, civilians in

post exchanges and domestics). Lumber and mineral exports were almost doubled from 1937 to 1947. Fisheries exports increased almost five times in the same period from $7,500,000 to $34,000,000.

## *Civilian Food Consumption:*

Clear-cut estimates of the food consumption in the years 1944-1948 were not possible to obtain, being complicated by a number of factors as, for example, the presence of military and naval personnel during the war. Certain facts, however, were established. There had been an increase of about 80% in evaporated milk supplies between 1944-48 (Table 1). Assuming complete consumption by civilians,* Aykroyd *et al* (1) estimated the increase in per capita consumption of reconstituted fluid milk would be from 1.9 to 3.5 oz. per day. This would have contributed an additional 0.08 mg. of riboflavin, 0.02 mg. of thiamine, 90 I.U. of vitamin A and 54 mg. of calcium to the daily diet.

**Table 1. Evaporated Milk Imports (1)**

| Year | Imports Lbs. | Grams per person per day |
|---|---|---|
| 1938-39 | 4,430,000 | 18.4 |
| 1943-44 | 6,972,000 | 27.5 |
| 1944-45 | 7,909,000 | 29.8 |
| 1945-46 | 10,472,000 | 40.5 |
| 1946-47 | 13,217,000 | 50.7 |
| 1947-48 | 13,090,000 | 49.6 |

Imports of sugar, jam, syrups and candy increased greatly and that of white flour remained consistently high (about 40% of the total calories). In the first half of the four-year period fresh and canned fruit (mostly citrus fruits and juices) nearly doubled, but then dropped again to previous levels. Accurate data on imports of eggs, fats and oils and fresh, green vegetables were not available, although a slight increase was presumed to have occurred. Locally produced foods remained almost the same as did consequently the consumption of fish and fluid milk. Despite educational programs, local gardens had apparently declined in number and production.

The population as a whole reflected the general trend of economic improvement. In Norris Point, for example, houses had been painted, a new fish cannery established, transportation facilities were improved, and a few more families owned cows. However, no improvement was noted as yet in

*Armed forces personnel obtained the majority of their food rations through service channels; only a small portion of their food consumption, therefore, tapped the civilian food supply.

food storage facilities or in agricultural production. As the investigators (2) point out, the only change in available foods appeared to be a slight increase in fluid milk, margarine fortified to a higher level with vitamin A, and the replacement of unenriched with enriched flour.

## *General Nutrition Program, 1944-1948:*

Aykroyd *et al* (1) who conducted the eastern coast resurvey have described in detail the program underway during 1944-48:

In addition to the rising economic status of Newfoundland, which had led to greater importation of food and thereby had affected the nutritional situation to some extent, measures aimed directly at improving the nutrition of the people had been undertaken by the Government and other agencies. They comprised a program for public education in nutrition, distribution in the schools of a hot milk drink, distribution of cod liver oil, distribution to certain individuals of concentrated orange juice and improvement of the quality of margarine and white flour through fortification of the margarine with vitamin A and enrichment of the flour with thiamine, riboflavin, niacin, iron and calcium.

*Public education*—Increased emphasis on nutritional considerations had entered into the radio advertising of processed foods. The importance of nutrition in the prevention and treatment of tuberculosis had been emphasized in a very excellent colored motion picture film on tuberculosis. Other efforts to teach improved dietary habits had been made by the Department of Public Health and Welfare, the Department of Education and various private organizations, such as the Red Cross. In 1947 an experienced nutritionist was added to the staff of the Department of Public Health and Welfare. Her work was effected through the teachers in the schools, the women's civic bodies and the public health nurses. Another innovation was instruction in nutrition in the teacher's training school, Memorial College, St. John's. A pamphlet on nutrition designed especially to meet conditions in Newfoundland was distributed in 1947 to all school teachers. Other methods of approach included weekly radio talks, press articles and talks to adult education groups.

Little of this educational activity got underway before the early months of 1947. That it was beginning to have effects in 1948 is indisputable, but that it had significantly influenced the nutritional condition of the people by the time of the resurvey is doubtful. Dietary habits change slowly.

*School feeding*—Government resources had not permitted undertaking a full-scale school feeding program. What had occurred was the free distribution to a large majority of the schools of dried non-fat milk powder. This was flavored with cocoa and sweetened with sugar, and from it a hot drink was prepared which the children liked and consumed in cups or mugs they brought to school. The average serving was from 4 to 6 ounces. The hot drink program was initiated in a small number of schools in 1946. The formula was improved and distribution was extended in the school year beginning September, 1947. The powder had the following percentage composition:

| | |
|---|---|
| Spray dried non-fat milk powder | 70 |
| Sugar | 22 |
| Cocoa | 8 |

The quantity of this powder distributed in the school year 1947-48 was about 8.5 pounds per child to 50,000 out of a possible total of 70,000 grade school children. Each child obtained about 24 gm. of powder per day for 160 days of the year. Thus, for a full year the contribution would augment the diet per day per child by no more than 38 calories, 2.7 gm. of protein, 0.03 mgm. of thiamine, 0.15 mgm. of riboflavin, 0.10 mgm. of niacin, 97.0 mgm. of calcium and 0.07 mgm. of iron.

*Other distributions*—Also made available free of charge in the school year 1947-48 was cod liver oil. It was distributed during three winter months. The total amount supplied was 3,623 gallons which theoretically may have provided a teaspoonful each day for 82 days for each of some 55,000 of the estimated 70,000 grade school children. However, this was not everywhere accepted well. Cod liver oil is a product of the fisheries and perhaps because of this it possesses less prestige in Newfoundland than do other less familiar medicinal preparations. It was not ingested in the school under the teacher's eye, and there is much doubt as to whether many of the children actually consumed it.

Another item distributed free of charge in 1947-48 was concentrated orange juice. It went to expectant and nursing mothers and to infants under one year of age. It was said to contain 220 mgm. of ascorbic acid per 100 gm. and the quantity dispensed was 880 gallons. However, were this amount to be divided equally among the estimated total of 23,000 mothers and infants each individual would have received from it only 1.1 mgm. of ascorbic acid daily for one year.

*Fortification of margarine*—All margarine sold in Newfoundland for years past has been manufactured in Newfoundland from imported fats. After January of 1945 all of it was fortified with vitamin A. The required content of vitamin A was made 30 I.U. per gram in 1945 and 45 I.U. per gram after January, 1946. This provided about 1,575 units of vitamin A per person per day. The contribution would double the estimated provision per head of vitamin A in 1944.

*Enrichment of white flour*—Cognizant of the large contribution of white flour to the total calories of the diet, the Government of Newfoundland took steps in 1943 to improve the nutritional quality of this product. Enrichment of white flour with thiamine, riboflavin, niacin and iron was made compulsory. In consequence, beginning with the fiscal year 1944-45, all imported white wheat flour has contained, per pound (0.46 kg.), a minimum of 2.0 mgm. of thiamine, 1.2 mgm. of riboflavin, 16 mgm. of niacin and 13 mgm. of iron. An additional requirement was imposed in October, 1947, namely, the inclusion of bone meal in an amount sufficient to provide not less than 500 mgm. of calcium per pound.

In the 1944 report (3), estimated figures on a per head basis were for thiamine 0.90 to 0.96 mgm., for riboflavin 0.80 to 1.03 mgm. and for calcium 360 to 415 mgm. Enrichment of the flour approximately doubled these low figures, bringing all of them close to the allowances recommended by the Food and Nutrition Board of the National Research Council, U. S. A. Furthermore, by this enrichment the supplies of niacin and iron, which were thought to be borderline in adequacy in 1944, were very substantially increased.

## *Resurvey Findings:*

The resurvey procedure was essentially the same, in both east and west coast studies, as in the earlier studies in 1944. In many cases, the same persons and family groups were re-examined.

Clinical and laboratory findings reported by Aykroyd and collaborators (1) give rise to the following general conclusions:

There was no improvement in the prevalence of lesions attributed to ascorbic acid deficiency. Some of the gingival lesions were even greater and blood levels of ascorbic acid were found to be noticeably lower. They did, however, find a decrease in the number of lesions which might be related to thiamine, riboflavin, niacin and vitamin A deficiency. Increased alertness, especially among the children, was remarkable as contrasted with the apathetic, unnaturally subdued attitudes observed in 1944. Complaints as to "Newfoundland stomach" (dyspepsia, flatulence, constipation) were markedly de-

creased. These latter two observations indicated a possible decrease in subclinical thiamine deficiency due to an increase of this element in the diet. Blood and urine analyses corroborated clinical findings of improved thiamine and riboflavin status. This was believed to be the result chiefly of the use of enriched flour.

The investigation at Norris Point (2) resulted in nearly identical findings. The only differences seemed to be a failure to find evidence of a decrease in symptoms referrable to vitamin A and riboflavin deficiency; evidence of a decrease in manifestations of B complex deficiency was confirmed, clinical observations being closely corroborated by laboratory findings and dietary studies. (Table 2, see page 7). Both Aykroyd *et al* and Goldsmith *et al* attributed the nutritional improvement chiefly to the use of enriched flour, the former group indicating some response to the increased vitamin A fortification of margarine as well.

**Diet Analysis:** From Table 2 it can be seen that the basic diet (Norris Point) consisted of bread, crackers, cereal grains, potatoes, desserts (cake, pie, cookies) molasses, jams and tea (colored with 1—2 tsp. of evaporated milk). These foods were eaten two or more times a day. Fresh fruits and green vegetables were not common; tomatoes were used only in small amounts in soups or stews; dried fruits were used chiefly in cakes and cookies.

Fish and small amounts of lean meat (wild game and canned beef) were the main source of protein; served once a week or more; of equal importance among 90% of the families as a source of protein were dried beans.

All groups showed a deficiency in milk consumption which was most pronounced in the post-partum women and younger children (Table 3).

**Table 3. Grams of Milk Consumed per Day (Calculated on a Whole Milk Basis) (2)**

| Quartiles | Women | | Men | Children | | |
|---|---|---|---|---|---|---|
| | Post partum | Other | | 3-6 Years | 7-9 Years | 10-14 Years |
| First | 48 | 70 | 0 | 60 | 40 | 40 |
| Second | 116 | 150 | 90 | 120 | 62 | 330 |
| Third | 241 | 306 | 770 | 378 | 150 | 630 |

## *Conclusion:*

On the basis of the several nutrition surveys and of the resurvey findings the medical group (1, 3) invited by the Newfoundland government to under-

## Table 2. Frequency of Consumption of Foods by 45 Families* (2)

| Foods | | Daily Four Times a Week | One to Three Times a Week | Once a Month or Less | Never |
|---|---|---|---|---|---|
| Bread, enriched | 45 | — | — | — | — |
| Crackers | 35 | 3 | 4 | — | 3 |
| Cereals, whole grain or enriched | 16 | 8 | 14 | 3 | 4 |
| non-enriched | — | 1 | 19 | 22 | 3 |
| Desserts | 38 | 4 | 3 | — | — |
| Fats | | | | | |
| butter | 5 | — | — | — | 40 |
| margarine | 40 | — | — | — | 5 |
| bacon | 2 | 2 | 14 | 7 | 20 |
| fat meat | 4 | 3 | 20 | 11 | 7 |
| Potatoes | 45 | — | — | — | — |
| Jam and Jelly | 36 | 7 | 1 | 1 | — |
| Molasses | 33 | 4 | 3 | 3 | 2 |
| Tea | 45 | — | — | — | — |
| Fish | — | 3 | 40 | 2 | — |
| Eggs | 9† | 7† | 21† | 3 | 5 |
| Lean meat, including game | — | 5 | 34 | 6 | — |
| Cheese | — | 1 | 13 | 13 | 18 |
| Dried peas and beans | — | 3 | 37 | 3 | 2 |
| Nuts, peanut butter | 2 | 2 | 5 | 9 | 27 |
| Dried fruits | 1 | 1 | 19 | 15 | 9 |
| Citrus fruits or juices | 2 | 8 | 13 | 13 | 9 |
| Other fruits, raw or canned | 1 | 1 | 21 | 12 | 10 |
| Tomatoes | — | 6 | 24 | 11 | 4 |
| Vegetables, leafy green and yellow** | 3 | 3 | 27 | 5 | 7 |
| Vegetables, other | 3 | 5 | 25 | 9 | 3 |
| Ice cream** | 6 | 2 | 18 | 10 | 9 |
| Soft drinks** | 6 | 5 | 8 | 5 | 21 |

*Milk was consumed frequently in small amounts. The quantities were so small that frequency is a poor indication of the consumption. For estimates of amounts see Table 3.

**Summer only.

† Only for about 6 months of the year.

take this study set forth a number of specific suggestions in a special report to the Commissioner for Public Health and Welfare. These included not only recommendations for the continuation of the enrichment of flour and the fortification of margarine, but the following. While these pertain specifically to the problems of Newfoundland, it can be seen how readily these recommendations of sound nutrition policy can be adapted to the needs of other countries and areas where the vital significance of improved nutrition as a public health problem is fast becoming recognized.

"A. Strengthening and extending the present educational program, especially in the schools and through the Public Health Nursing Service, with emphasis on the desirability of more milk for consumption by children and increasing consumption of citrus juice or fruit and of greater use of uncooked vegetables. With this should go an increased emphasis on cooking methods which conserve the vitamins and minerals in cooked vegetables and other foods; consideration to be given also to an increased use of the radio and newspaper for transmitting appropriate information and to the production and widespread showing of a nutrition film adapted to the special needs of Newfoundland. The excellent film on tuberculosis now in use is the type of film we have in mind.

"B. Co-operation of the closest kind, as recommended for all countries by FAO (Food and Agriculture Organization of the United Nations), between the Department of Public Health and Welfare and the Agricultural and Fisheries Division of the Department of Natural Resources, whenever the nutrition and health of the people is involved in policies affecting food production. Of particular significance, for example, is a recent trend to reduce the number of milk cows in the outports. We respectfully suggest a careful study of the possible consequences of such a trend on the availability of milk for children in the event that the ability of the people to purchase processed milk were lowered by economic recession.

"C. Extension of the distribution of cod liver oil or its equivalent and of milk powder to all schools with consideration given to the possibility of reenforcing this milk with ascorbic acid (vitamin C). The program initiated in 1947-48 of supplying concentrated orange juice to expectant and nursing mothers and to infants under one year likewise could be extended with advantage.

"D. Maintaining consumption of milk and citrus juices and making these and other foods of high nutritional value available at low prices. The significance to health of an adequate consumption of milk or processed milk, citrus juices, green and yellow vegetables, enriched or whole grain cereals and butter or fortified margarine is so great that profound consideration should be given to procedures by which the cost of these protective foods may be held at such a level that such foods can be purchased in adequate amounts for health by low income consumers."

## REFERENCES CITED

1. AYKROYD, W. R., N. Jolliffe, O. H. Lowry, P. E. Moore, W. H. Sebrell, R. E. Shank, F. F. Tisdall, R. M. Wilder and P. C. Zamecnik. Medical resurvey of nutrition in Newfoundland in 1948. *Can. Med. Assoc. J. 60,* 329 (1949).

2. GOLDSMITH, G. A., W. J. Darby, R. C. Steinkamp, A. S. Beam and E. McDevitt. Resurvey of nutritional status in Norris Point, Newfoundland. *J. Nutr. 40,* 41 (1950).

3. ADAMSTONE, J. D., N. Jolliffe, H. D. Kruse, O. H. Lowry, P. E. Moore, B. S. Platt, W. H. Sebrell, J. W. Tice, F. F. Tisdall, R. M. Wilder and P. C. Zamecnik. Medical survey of nutrition in Newfoundland. *Can. Med. Assoc. J. 52,* 227 (1945).

4. DEAN, W. T. Food consumption in a rural area of southwest Virginia. To be published; cited in reference (2).

5. ROBINSON, W. D., R. C. Steinkamp and M. M. Kaser. A study of the nutritional status of a population living in the First District of Williamson County, Tennessee. Unpublished report of the Tennessee-Vanderbilt Nutrition Project to the Tennessee State Dept. of Health (1944) Cited ibid (2).

6. YOUMANS, J. B., E. W. Patton and R. Kern. Surveys of the nutrition of populations. *Am. J. Pub. Health 33,* 58 (1943).

7. YOUMANS, J. B., E. W. Patton, W. R. Sutton, R. Kern and R. Steinkamp. Surveys of the nutrition of populations. *Am. J. Pub. Health 33,* 955 (1943).

8. YOUMANS, J. B., E. W. Patton, W. R. Sutton, R. Kern and R. Steinkamp. Surveys of the nutrition of populations. *Am. J. Pub. Health 34,* 368 (1944).

9. YOUMANS, J. B., E. W. Patton, W. R. Sutton, R. Kern and R. Steinkamp. Surveys of the nutrition of populations. *Am. J. Pub. Health 34,* 1049 (1944).

10. Food and Nutrition Board. Recommended dietary allowances. N.R.C. Reprint and Circular Series No. 129, Washington, D. C. (1948).

# *NEWS DIGEST*

**IMPROVED KEEPING QUALITY OF DRIED MILK:** Experiments by the Bureau of Dairy Industry, U. S. Department of Agriculture, indicate that the keeping quality of dried milk can be improved by subjecting it to carbon dioxide under pressure before sealing it in cans.

The present commercial procedure is to evacuate the air for about an hour and then let nitrogen in to restore atmospheric pressure before sealing the cans. The substitution of carbon dioxide for nitrogen in this procedure resulted in improved keeping quality, but even better results were obtained by forcing carbon dioxide in until it built up a pressure of 50 lbs., holding at that pressure for 3 hours, and then releasing it and sealing the cans. Nitrogen was also tested under 50-lb. pressure, but it did not have the same effect as carbon dioxide.

The beneficial effect of the carbon dioxide may be attributed either to increased displacement of oxygen by carbon dioxide or to its action as an acid to regenerate natural anti-oxidants after they are destroyed, or to a combination of both factors.—Report of the Chief of the Bureau of Dairy Industry, U. S. Dept. of Agriculture 1949.

**IRON CONTENT OF CHOCOLATE PRODUCTS:** The use of improved methods for iron analysis reveals that the iron content of cocoa, baking chocolate and milk chocolate, although varying widely among commercial brands, is considerably higher than previously supposed. For cocoa, the mean values of 6.71 and 10.86 mg. per 100 g. for 10 samples each of two commercial brands were several times greater than the value of 2.7 mg. reported in the 1945 Tables of Food Composition of the U.S.D.A. Similarly, mean values of 4.29 mg. and 6.87 mg. per 100 g. were found for baking chocolate as compared with U.S.D.A. old values of 2.5 mg. Milk chocolate was found to contain about one-fourth as much iron (0.91 mg. per 100 g.) as baking chocolate because it is "diluted" with milk and sugar. Average new values would indicate that a square of baking chocolate contains almost 2 mg. of iron and a tablespoon of cocoa, almost 1 mg. — *J. Am. Diet. Assoc. 26,* 93 (1950).

**IRON REQUIREMENT OF ADOLESCENT GIRLS:** Six girls, thirteen and fourteen years old, all of whom had passed the menarche, were fed in two consecutive four-week periods preceded by an adjustment period of one week. During the first four-week period the average intake of iron was 8.6 mg. per day, and during the second period the intake was raised to 11.7 mg. daily. The iron required by the six subjects was estimated by adding together the amount needed to replace menstrual losses as determined by analysis and the amount needed for growth based on the estimates of Heath and Patek. On an intake of approximately 8.6 mg. per day, retentions for the six girls ranged from 0.80 to 1.54 mg. per day, or an average of 1.18 mg. daily. The retention of one subject was inadequate. On an intake of approximately 11.7 mg. per day, retentions for the six girls were 0.33 to 2.22 mg. per day or an average of 1.52 mg. daily. On the basis of the six cases in this study, a dietary intake of 12 to 13 mg. iron per day is recommended for girls of this age.—*J. Nutr. 39,* 67 (1949).

**SUPPLEMENTS FOR PLANT PROTEINS IN CHICK NUTRITION:** Soybean oil meal and a commercial cottonseed meal low in gossypol were

investigated as the sole sources of protein for growing chicks. Soybean oil meal supported a normal rate of growth when it was supplemented with a vitamin $B_{12}$ concentrate equivalent to 10 to 20 micrograms of crystalline vitamin $B_{12}$ per kilogram of diet. Cottonseed meal was equal to soybean oil meal when it was supplemented with vitamin $B_{12}$ and 0.2% of L-lysine. Cottonseed meal with lysine but without vitamin $B_{12}$ gave a subnormal rate of growth, which showed that it was deficient in this vitamin.

Soybean oil meal was used to supplement the lysine deficiency of cottonseed meal. The combination of the two protein concentrates supported as rapid a rate of growth when supplemented with vitamin $B_{12}$ as did soybean oil meal alone. Without vitamin $B_{12}$ growth was at a subnormal rate. These data suggest that plant proteins of relatively low value may be used as a source of protein for growing chicks when they are supplemented with soybean oil meal and vitamin $B_{12}$. — *J. Nutr. 40,* 169 (1950).

**CHOLESTEROL IN ATHEROSCLEROSIS:** The role of cholesterol as a possible causative factor in atherosclerosis and other forms of hardening of the arteries has been a matter of great interest and considerable speculation for many years. Attempts to correlate blood cholesterol levels, for example, with the occurrence of atherosclerosis have been erratic and highly inconclusive. A major step toward the ultimate resolution of this problem has been made as a result of researches reported during this month. According to these studies it has been determined that cholesterol is incorporated into various types of giant lipoprotein molecules. These are distinguished from each other by specific gravity determinations made by means of the ultracentrifuge. A definite correlation has been obtained between the blood level occurrence of one specific class of giant cholesterol-containing molecule, [classified as $S_f$ 10-20 (in humans) and $S_f$ 10-30 (in rabbits)] and the incidence of atherosclerosis in both man and experimental animals. Thus, it is not the total amount of cholesterol in the diet or in the blood which is related to the development of the disease, but rather the amount of the specific class of cholesterol-containing molecules circulating in the blood stream. Why this class of molecules is synthesized to a greater extent by some individuals and not by others remains a matter for future investigation. It may be that in the answer to this question lies the nature of the cause and cure of atherosclerosis.—*Science 111,* 166 (1950).

**DENTAL EROSION AND ACID BEVERAGES:** Studies have been conducted with molars removed from experimental animals (rats) as well as from humans to determine the effect of various acid solutions and beverages on these teeth. In the rat, erosion of the molar teeth was detected after the consumption of 10 cc. acid solutions of the same strength used in cola beverages. A comparative test of acid during a six-month period indicated that tomato juice had the least effect and 0.055% phosphoric acid the most. Rat teeth subjected to the phosphoric acid were eroded nearly to the gum line. Human teeth suspended in cola beverage or its equivalent in sucrose-phosphoric acid gradually lose calcium in the course of two weeks. The buffer capacity of the human mouth against cola beverages differs widely, but it is fairly consistent for a given individual. Even after an exposure of a half minute, some mouths cannot buffer the solution to a pH higher than 3.5, which is considered marginal for erosion. Rhubarb juice combined with equal parts of lemon juice protected the teeth against erosion.—*J. Nutr. 39,* 313 (1949).

**PROTEIN UTILIZATION:** The effect of supplementary carbohydrate on the utilization of dietary protein was demonstrated in recent studies with laboratory animals. Adult rats were first given a diet with the protein fed separately from the carbohydrate. They were then given the same diet with most of the carbohydrate fed along with the protein. The immediate effect of this change in the time of feeding carbohydrate was a considerable improvement in nitrogen balance. After a few days, however, nitrogen balance returned to its original level. Subsequent separation of the times of feeding carbohydrate and protein caused a transient impairment of nitrogen balance. It has been concluded that protein utilization is affected by the presence of carbohydrate in the same meal.—*J. Nutr. 39,* 375 (1949).

**VITAMIN $B_{12b}$:** Two crystalline vitamin $B_{12}$ products have been produced, each showing a different, characteristic absorption spectrum. They have been designated vitamin $B_{12a}$ and vitamin $B_{12b}$. The hemopoietic activity of the latter, vitamin $B_{12b}$, has been tested clinically. Four patients with acute pernicious anemia had a satisfactory hemopoietic and clinical response to dosage with vitamin $B_{12b}$. Further study is necessary to determine whether this material is as active per unit of weight as vitamin $B_{12}$ itself. Preliminary studies indicate that vitamin $B_{12b}$ is effective in nutritional macrocytic anemia and tropical sprue, but more conclusive studies must be made.—*S. Med. J. 43,* 50 (1950).

**HUMAN FACTOR IN NUTRITION:** Nutrition taken alone is as useless as synthetic vitamins with an otherwise inadequate diet. For a change of habits, psychological changes must take place in the person. Food choices are bound up with emotional attitudes unconsciously acquired but grimly held. Those who assume that food is eaten primarily for health live apart from mankind. Those who believe food habits are easily changed are not aware of the roots of the dislikes.

The infant who has not sensed affection while he was being fed or who has been distressed or unduly hungry is likely to become a food problem and remain one. A mother's critical attitude toward his food habits or toward his lack of muscular coordination and consequent messiness may result in his refusing certain foods for all time. If a child anticipates adverse reaction at mealtime, his actions become subversive and he releases his spleen by food refusals. The child who eats well has been blessed with an understanding mother.

Possibly we actually improve health more by interesting young students in good baby care than we do by teaching nutrition as such. If mothers and young girls looked upon each addition to an infant's diet as an educational step, not as a nutritional necessity, tensions that produce conditioned malnutrition might be prevented. If we emphasized the difficulty involved in learning to drink from a cup, to get sticky food from a spoon with the tongue, to handle utensils, or to accept new flavors, there would be fewer children refusing foods and courting undernutrition. A mother who thinks her child is ready to learn to take cereal or vegetables from a spoon at four months is less tense than one who thinks that without the added mineral or vitamin supply he will be under par.—*J. Home Eco. 41,* 433 (1949).